

E7.4-10160.

CR-136287

"Made available under NASA sponsorship
in the interest of early and wide dis-
semination of Earth Resources Survey
Program information and without liability
for any use made thereof."

THIRD QUARTERLY PROGRESS REPORT

(8 September - 31 December 1973)

E74-10160) APPLICABILITY OF SKYLAB

N74-14028

REMOTE SENSING FOR DETECTION AND

MONITORING OF SURFACE MINING ACTIVITIES

Quarterly Progress (Wolf Research and

Unclas

Development Corp) 6 p HC \$3 00 CSCL 08I G3/13

00160

APPLICABILITY OF SKYLAB

REMOTE SENSING FOR DETECTION AND

MONITORING OF SURFACE MINING ACTIVITIES

SKYLAB EREP INVESTIGATION 9669

TECHNICAL MONITOR: Roger Hicks

Prepared by

R.L. BROOKS

J.D. PENNEWELL

WOLF RESEARCH AND DEVELOPMENT CORPORATION

Pocomoke, Maryland 21851

28 December 1973

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION-----	1
2.0 PROGRESS (8 September 1973 to 31 December 1973)-----	2
2.1 RECEIPT OF SL-2 IMAGERY-----	2
2.2 GROUND TRACK DATA FOR SL-3-----	2
2.3 ERTS-3 SYMPOSIUM, WASHINGTON, D.C.-----	2
2.4 INFARED REQUIREMENTS FOR SL-4-----	3
2.5 LARGE SCALE PHOTOGRAPHIC COVERAGE-----	3
3.0 PROBLEMS-----	3
3.1 SKYLAB DATA RECEIPT AND CONTRACT EXTENSION-----	3
4.0 PLANS-----	3
4.1 OHIO TEST SITE VISIT-----	3
4.2 DATA REDUCTION AND OTHER ACTIVITIES-----	4
5.0 DISTRIBUTION-----	5

1.0 INTRODUCTION

The objective of this investigation is to evaluate EREP imagery as a means of detecting and monitoring strip mines, their effects, and reclamation activities. EREP S-190 A and S-190 B imagery of a tri-state test area will be analyzed, and some S-192 thermal imagery during a night time pass is desired in hopes of detecting acid waste waters whose temperatures might exceed those of the surrounding environment.

Initially, the investigation will consist of a census of active and inactive strip mines along with estimates of disturbed and reclaimed acreage. Notable damage to the environment will also be included.

The primary test site (816556) extends from latitude 39°00'N to 40°30'N, and longitude 80°00'W to 83°00'W; and encompasses portions of Ohio, West Virginia, and Pennsylvania. The alternate test site (816557) extends from latitude 37°00'N to 39°00'N, and longitude 86°00'W to 89°00'W; and encompasses portions of Indiana, Kentucky, and Illinois.

2.0 PROGRESS

2.1 RECEIPT OF SKYLAB-2 IMAGERY

Skylab-2 data photography was received on November 21, 1973. The 9-inch transparencies consist of:

Roll No. 12 frames 135-146

11 frames 236-249

10 frames 143-154, 252-265

09 frames 143-154, 252-265

08 frames 135-146, 236-249

07 frames 135-146

81 frames 188-200, 334, 347

70-mm duplicate transparencies of the above were received on December 10, 1973.

Review and plots of the ground track of the data imagery indicates that the coverage area is westward of the primary test site where the majority of mining activity reports and surface information have been collected.

2.2 GROUND TRACK DATA FOR SL-3

The ground tracks for SL-3 were received on December 7, 1973. This data has been plotted on large scale charts of the test site areas. Imagery coverage from SL-3 passes through the center of the primary test area in which surface mining activity reports and surveys have been concentrated. SL-3 imagery has not yet been received.

2.3 ERTS-3 SYMPOSIUM, WASHINGTON, D.C.

Mr. Pennewell attended the ERTS-3 Symposium on December 18-19, 1973 in Washington, D.C., to observe progress and activities of ERTS investigators involved with surface mining. A paper presented by the State of

Ohio personnel indicates that ERTS imagery coupled with aircraft photography is being investigated as a potential tool to detect and monitor surface mining activities and reclamation of stripped areas. Personnel at the University of Michigan, in another paper, are utilizing digital computer techniques for automated recognition of surface mining activities from ERTS Digital Tapes.

2.4 INFRARED REQUIREMENTS FOR SL-4

A telephone conversation with NASA Houston requested our requirements and justification for thermal infrared data. The requested response was TWX-ed on October 26, 1973.

2.5 LARGE SCALE PHOTOGRAPHIC COVERAGE

Dr. Jelacic of our staff contacted several major coal companies and obtained several large scale photographic prints of surface mines in the Ohio region of our test site. The prints taken at various dates offer base-line data for indicating areal measurements of disturbed surface areas and the geographical directional movement of the mining operation.

3.0 PROBLEMS

3.1 SKYLAB DATA RECEIPT AND CONTRACT EXTENSION

Due to the 3-month delay in our receipt of SL-2 imagery, we are requesting a 3-month extension to our contract.

4.0 PLANS

4.1 OHIO TEST SITE VISIT

Mr. Robert Verbosky of the Consolidated Coal Company in Cadiz, Ohio has been contacted for our visiting mining and reclamation operations in the southeastern

Ohio region. This visit has been scheduled about the middle of January 1974.

4.2 DATA REDUCTION AND OTHER ACTIVITIES

Since SL-2 data coverage was outside of our prime test area and SL-3 data coverage does go through the center of our test area, limited activities will be maintained until receipt of SL-3 data. Upon receipt of SL-3 data efforts will be made to conform with the milestone schedule as amended with the three month extension.